PATENT ABSTRACTS OF JAPAN

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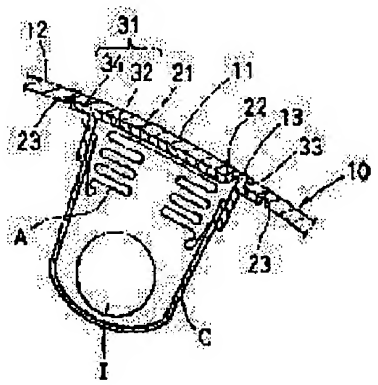
(54) CAR INTERIOR SIDE MEMBER STRUCTURE HAVING AIR BAG DOOR SECTION INTEGRALLY

(57)Abstract:
PROBLEM TO BE SOLVED: To prevent the occurrence of cracking or tearing in the peripheral portion of a reinforcing member during an air bag expansion in an extremely low temperature in a car interior side member having an air bag door section integrally.
SOLUTION: In a car interior side member 10 wherein a reinforcing member 31 having a connection section 34 with an air bag housing case C formed in the vicinity of the back surface edge of a plate section 32 is integrally provided in the back surface of a car body side member main body 21 made of a hard resin, a scheduled rupture section 13 ruptured during an air bag expansion is formed in an integral portion between the plate section 32 of the reinforcing member 31 and the car interior side member main body 21 and an air bag section 11 plotted by the scheduled rupture section 13 is provided, the car interior side member main body 21 includes a weak section 23 ruptured before the scheduled rupture section 13 during the air bag expansion along the outer periphery of the plate section of the reinforcing member 31.



LEGAL STATUS

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[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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[Date of extinction of right]

* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] While being prepared in the rear face of the vehicle room flank material main part made of rigid resin at one, the reinforcement member which consists of a plate-like part and the air bag hold case connection section formed near the edge of the rear face In the vehicle room flank material which has the air bag door section which the fracture schedule section fractured at the time of air bag expansion was formed in the one section of the plate-like part of a member, and a vehicle room flank material main part, and was divided in this fracture schedule section the aforementioned reinforcement — the aforementioned vehicle room flank material main part — the aforementioned reinforcement — the structure of the vehicle room flank material which has in one the air bag door section characterized by forming the fragile site fractured ahead of the aforementioned fracture schedule section along with the plate-like part periphery of a member at the time of air bag expansion
[Claim 2] Structure of the vehicle room flank material which has in one the air bag door section characterized by a vehicle room flank material main part having the high rigidity section on the fragile site outside in a claim 1.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to the structure of the vehicle room flank material which has the air bag door section in one.
[0002]
[Description of the Prior Art] In recent years, in the automobile, air bag equipment came to be formed also in a passenger seat. This air bag equipment is attached in the background of the vehicle room flank material which consists of an air bag, an air bag hold case called canister held where the air bag is folded up, and a starting device (inflator), and consists of an instrument panel of the front face of a passenger seat etc. The air bag section of the vehicle room flank material in which air bag equipment was formed has expansion opening for an air bag, and this opening is covered by the air bag door with the aforementioned instrument panel and appearance of the same kind at time of peace. And when an automobile once gets a big shock by collision etc., the air bag contained in the aforementioned air bag case operates and expands, and opening of the air bag door is pushed and carried out from a background.
[0003] However, if it is in the thing of the structure where expansion opening for air bags and an air bag door are constituted by another object, it is easy to produce a crevice to the circumference of an air bag door by few [a product size] product contraction accompanying [vary or] use etc., and there is a possibility that the appearance of an instrument panel may be spoiled. Moreover, attaching an air bag door in expansion opening for air bags of an instrument panel according to a back process makes a man day increase.
[0004] Then, as shown in 13 view which is drawing 12 and its 13 -13 cross section, this invention person considered the structure of the vehicle room flank material (instrument panel) 70 which has the general section N and the air bag door section D formed in one, in order to cancel the aforementioned fault. the vehicle room flank material main part 71 made of rigid resin with which the vehicle room flank material 70 of this structure consists of polypropylene resin etc., and the reinforcement formed in the rear face at one — it consists of a member 73 and the aforementioned reinforcement — the fracture schedule section 72 of thin meat is formed in the one portions of a member 73 and the vehicle room flank material main part 71, and partition formation of the air bag door section D is carried out by the fracture schedule section 72
[0005] the aforementioned reinforcement — a member 73 consists of a plate-like part 74 for reinforcing the rear face of the air bag door section D of the vehicle room flank material main part 71, and making the fracture schedule section 72 fracture certainly at the time of air bag expansion, and the air bag hold case connection section 75 formed near the edge of the rear face The air bag hold case connection section 75 is the portion used for connection in the air bag hold case C, consists of the shape of a frame and serves as a hinge region at the time of the aperture of the air bag door section D. this reinforcement — since a member 73 will become heavy if it is made into metal, it consists of a product made of a resin The agreement A in drawing is an air bag, and I is a starting device.
[0006] if it is in this structure, and a starting device I operates and an air bag A expands, as shown in drawing 14 — the air bag A — the reinforcement on the rear face of air bag door

section D — a member 73 is pressed to a vehicle interior-of-a-room side, and the air bag door section D swells to a vehicle interior-of-a-room side first and expansion of the further air bag A — reinforcement — a member 73 presses — having — it — the vehicle room flank material 70 — near [connection section 75] the air bag hold case C — especially — near the corner section of the connection section 75 — size — stress is added and it deforms greatly Then, the fracture schedule section 72 fractures, the air bag door section D opens, and an air bag A develops to the vehicle interior of a room.

[0007] however, the reinforcement which deforms greatly as mentioned above before the aforementioned fracture schedule section 72 will fracture (before the air bag door section D opens), if the expansion examination of an air bag is performed to the vehicle room flank material 70 of the aforementioned structure below on conditions severer than an actual automobile service condition, i.e., the brittle temperature of the aforementioned vehicle room flank material main part 70, — a crack and a crack may be produced on the vehicle room flank material main part 71 in the periphery of a member 73 Furthermore, there is also a possibility that the portion which produced the crack depending on the case, and the broken portion may disperse. As for such a phenomenon, not being generated is desirable when what is what is generated in the superthermal conditions which cannot happen at the time of the usual automobile use pursues ideal air bag equipment.

[0008]

[Problem(s) to be Solved by the Invention] then, the vehicle room flank material which has the air bag door section in one in view of the point of the above [this invention] — setting — the time of the air bag expansion at the time of ultra low temperature — reinforcement — it aims at preventing a crack and a crack occurring in the periphery of a member

[0009]

[Means for Solving the Problem] While this invention is prepared in the rear face of the vehicle room flank material main part made of rigid resin at one, the reinforcement member which consists of a plate-like part and the air bag hold case connection section formed near the edge of the rear face In the vehicle room flank material which has the air bag door section which the fracture schedule section fractured at the time of air bag expansion was formed in the one section of the plate-like part of a member, and a vehicle room flank material main part, and was divided in this fracture schedule section the aforementioned reinforcement — the aforementioned vehicle room flank material main part — the aforementioned reinforcement — the structure of the vehicle room flank material which has in one the air bag door section characterized by forming the fragile site fractured ahead of the aforementioned fracture schedule section along with the plate-like part periphery of a member at the time of air bag expansion is started

[0010] if it is in the structure of this invention — the time of air bag expansion — reinforcement — a member — the fragile site currently formed in the vehicle room flank material main part of a periphery position fractures ahead of the fracture schedule section for the air bag door sections Therefore, the air bag door portion connected with the air bag hold case can be made to separate from the vehicle room flank material main part of the circumference in the stage of the first stage at the time of air bag expansion. Therefore, even if the still bigger press deformation force joins the air bag door section by subsequent air bag expansion, the press deformation force is not received in the vehicle room flank material main part which is located in this air bag door outside side and which carried out [aforementioned] separation at all, but neither a crack nor a crack is produced.

[0011] Moreover, if the high rigidity section is prepared in the fragile site outside of the aforementioned vehicle room flank material main part, since the press force will concentrate on the aforementioned fragile site efficiently at the time of air bag expansion, the aforementioned fragile site can be made to fracture more certainly in the initial stage of air bag expansion. In addition, the fragile site of the aforementioned vehicle room flank material main part means that it is relatively weaker than other portions of a vehicle room flank material main part. Therefore, the aforementioned fragile site may form a brittle portion relatively near the high rigidity section by preparing the aforementioned quantity rigidity section near the brittle schedule section,

without it not only forming a vehicle room flank material main part as thin meat, but using it as thin meat.

[0012]

[Embodiments of the Invention] According to an attached drawing, this invention is explained in detail below. The perspective diagram in which the perspective diagram of the vehicle room flank material in which drawing 1 has the structure of this invention, and drawing 2 show the 2-2 cross section, and drawing 3 shows the background of the air bag door section of this example, the cross section in which drawing 4 shows the first stage at the time of air bag expansion of this example, and drawing 5 are the cross sections showing the time of air bag door section opening in this example.

[0013] Moreover, the important section cross section of vehicle room flank material in which drawing 6 shows other examples of this invention, the perspective diagram in which drawing 7 shows the background of the air bag door section of this example, the cross section in which drawing 8 shows the first stage at the time of air bag expansion of this example, the cross section in which drawing 9 shows the example of further others of this invention, the cross section in which drawing 10 shows the example of further others of this invention, and drawing 11 are the cross sections showing the example of further others of this invention.

[0014] The vehicle room flank material 10 shown in drawing 1 or drawing 3 is used as an instrument panel of an automobile, and has the air bag door section 11 in a passenger side at the other general sections 12 and one. the reinforcement by which this vehicle room flank material 10 was formed in the vehicle room flank material main part 21 and its background at one — it consists of a member 31, and the fracture schedule section 13 for fracturing at the time of air bag A expansion, and making possible the aperture of the air bag door section 11 is formed in the plane view abbreviation U typeface so that the air bag door section 11 may be divided In addition, let the flat-surface configuration of the fracture schedule section 13 be zygal.

[0015] The aforementioned vehicle room flank material main part 21 constitutes the front face while defining the appearance of the vehicle room flank material 10, and it consists of rigid resin mold goods formed in the necessary configuration by injection molding etc. Vehicle room flank material main part 21, the rigid resin to constitute has the intensity and rigidity for which vehicle room flank material is asked, and general-purpose rigid resin, such as polypropylene resin, is used. The bending elastics modulus according to JIS-K7203 from points, such as rigidity and configuration retentivity, especially are 20000 kgf/cm2. A thing 120 degrees C or more (4.6kgf load) has a desirable heat deflection temperature by JIS-K7207 above. this — an example — a vehicle — a room — a flank — material — a main part — 21 — bending — an elastic modulus — — 27000 — kgf/cm — two — a heat deflection temperature — 132 — degree C — thickness — 2.5 — mm — it is — polypropylene resin — (— PP —) — make — from — becoming .

[0016] the fragmentation section 22 forms in the portion of the fracture schedule section 13 of the aforementioned vehicle room flank material main part 21 along with the fracture schedule section 13 — having — the fragmentation section 22 — reinforcement of vehicle room flank material main part 21 rear face — the member 31 ate away and it has exposed on vehicle room flank material main part 21 front face Although the width of face of this fragmentation section 22 is proper, generally you may be about 2mm or less. in addition, this fragmentation section 22 — the vehicle room flank material main part 21 and a reinforcement resin — it is desirable by really fabricating further to prevent from distinguishing almost from superficies by making into the same color the color of the resin which constitutes a member 31

[0017] moreover, the fragile site 23 weaker than the other sections in the outside of the air bag door section 11 of the aforementioned vehicle room flank material main part 21 — reinforcement — it is formed along with the periphery of a member 31 this fragile site 23 — the time of air bag expansion — fracture of the aforementioned fracture schedule section 13 — previously — fracturing — reinforcement — a member — the general vehicle room flank material section 12 of the 31 circumference — reinforcement — it is made to dissociate from the laminating portion of a member 31 and the vehicle room flank material main part 21 The fragile site 23 of this example is formed with the thin meat by slitting of an abbreviation V typeface so that I may be well understood from drawing 2 and drawing 3 . Of course, it is good also as thin meat by the

configuration of not only an abbreviation V typeface but U typeface, or others. As for the thickness of the fragile site of the thin meat in that case, it is common to be referred to as about 0.3-0.5mm.

[0018] reinforcement — a member 31, while making it easy to reinforce the vehicle room flank material main part 21 of the air bag door section 11 aforementioned background, and to fracture in the aforementioned fracture schedule section 13 It is for concealing the fracture section end face of the stiff vehicle room flank material main part 21, and it is formed by the resin more flexible than the rigid resin which constitutes the aforementioned vehicle room flank material main part 21, and is prepared in the air bag door section 11 rear-face side of the vehicle room flank material main part 21 at one.

[0019] reinforcement of this example — the flection 33 crooked to the **** V typeface so that a member 31 might project to the vehicle room flank material main part 21 side in the thickness of 3mm, 150mm long, and the 320mm wide rectangular plate-like section 32 is formed at the plane view abbreviation U typeface according to the configuration of the aforementioned fracture schedule section 13 The aforementioned flection 33 eats into the fragmentation section 22 currently formed in the vehicle room flank material main part 21 of the fracture schedule section 13, and thickness of this peak is made thinner than the other sections so that it may be easy to fracture at the flection 33 peak. In this example, it could be about 0.3-0.5mm.

[0020] When the flection 33 crooked as mentioned above to the front-face side of the vehicle room flank material main part 21 pushes the fracture schedule section 13 neighborhood on time of peace from a vehicle room flank material main part 21 front-face side, in order that it may demonstrate the rigidity which serves as the press direction and abbreviation parallel direction, and becomes size, its on-the-strength enhancement effect in time of peace is high, and it also has the operation which prevents the crack of the fracture schedule section 13.

[0021] moreover, the aforementioned reinforcement — as for the member 31, the frame-like connection section 34 is formed near the edge of plate-like part 32 rear face This connection section 34 is inserted in the opening edge periphery of the air bag hold case C, and is used for connection to the air bag hold case C and this vehicle room flank material 10. In addition, the connection fixation is made using fixed meanses, such as a bolt which is not illustrated. the sign 35 shown in drawing 3 — the bolt insertion — it is a hole

[0022] the aforementioned reinforcement — from a resin with a member 31 more flexible than the rigid resin which constitutes the vehicle room flank material main part 21 — becoming — the bending elastic modulus of JIS-K7203 — 1000 kgf/cm2 - 5000 kgf/cm2 It is easy to fracture a resin by the flection 33 of the aforementioned fracture schedule section 13 at the time of air bag expansion, and it is desirable in respect of reinforcement of the air bag door section 11. the aforementioned vehicle room flank material main part 21 — bending — elastic-modulus 27000 kgf/cm2 the example of the product made from PP to a bird clapper — setting — reinforcement — a member 31 — bending elastic-modulus 3000 kgf/cm2 It consists of a TPO (polo thermoplastic elastomer olefin) resin.

[0023] in addition, fabrication of the aforementioned vehicle room flank material 10 — first — injection molding etc. — the aforementioned reinforcement — a member 31 — fabricating — subsequently — the reinforcement — a member 31 — a vehicle room flank material form block — as an insertion — arranging — rigid resin — injecting — reinforcement — it can carry out easily by forming the vehicle room flank material main part 21 which was united with the member 31 moreover, the time of injection molding of the aforementioned vehicle room flank material main part 21 — the aforementioned reinforcement — when sticking the crowning of the flection 33 of a member to **** of a vehicle room flank material form block, the vehicle room flank material main part 21 obtained was shown in drawing 2 — as — the fracture schedule section 13 for air bag door section 11 — setting — the aforementioned reinforcement — it becomes the fragmentation section 22 into which the flection 33 of a member 31 ate Moreover, the fragile site 23 of the thin meat of the aforementioned vehicle room flank material main part 21 may be formed from the beginning, and may be formed by the high frequency welder, **** or a cold-press cutter, etc. after fabrication.

[0024] According to this structure, since the air bag door section 11 is formed in the general

section 12 and one in the front face, the aforementioned vehicle room flank material 10 does not have a crevice in the circumference of the air bag door section 11, and its appearance is very good. and — the time of a shock joining an automobile by collision etc. — a starting device I — operating — an air bag A — expanding — the air bag A — reinforcement — the rear face of a member 31 is pushed and air bag door section 11 portion swells to a vehicle interior-of-a-room side that time — the vehicle room flank material 10 — reinforcement — since it connects with the air bag hold case C in the edge of a member 31, free deformation bars — having — the connection section 34 neighborhood — size — the press deformation force is added and it is crooked greatly consequently, reinforcement of the aforementioned vehicle room flank material main part 21 — a member — the fragile site 23 currently formed in 31 periphery — stress — concentrating — drawing 4 — like — fracturing — reinforcement — the portion with which the member 31 and the vehicle room flank material main part 21 were united dissociates from vehicle room flank material main part 21a of the general section 12 of the circumference

[0025] furthermore — if an air bag A expands — the aforementioned reinforcement — a member 31 is pressed, the vehicle room flank material of air bag door section 11 portion swells greatly to a vehicle interior-of-a-room side, the fracture schedule section 13 which divides the ** air bag door section 11 at last fractures, as shown in drawing 5 , the air bag door section 11 opens, and an air bag A develops to the vehicle interior of a room that time — the aforementioned reinforcement — vehicle room flank material main part 21a already separated from the portion in which a member 31 exists does not receive the press force at all therefore — even if it performs a collision examination to the vehicle room flank material 10 of this structure in the state of low temperature which is not produced at the time of the usual automobile use — the aforementioned reinforcement — a member — stress with 31 periphery impossible for is not added, but producing an irregular crack and an irregular crack is lost Agreement 13a is the fracture section of the air bag door section 11.

[0026] further — this example — setting — the reinforcement with the fracture section 13a end face of the aforementioned air bag door section 11 more flexible than the aforementioned vehicle room flank material main part 21 — since it will be in the state where it was concealed by the flection 33 of a member 31, stiff rigid resin is not exposed and it is suitable as vehicle room flank material

[0027] Next, other examples of this invention are shown. The cross section showing the structure of the vehicle room flank material 40 of the example of others [drawing 6], the partial perspective diagram in which drawing 7 shows the rear-face side of the air bag door section 41, and drawing 8 are the cross sections showing the early stages of air bag expansion in the vehicle room flank material.

[0028] the example which showed this vehicle room flank material 40 to drawing 1 or drawing 5 — — the same — the vehicle room flank material main part 51 and reinforcement — a member 61 — — becoming — the reinforcement — although it has a fragile site 52 on the vehicle room flank material main part 51 along with plate-like part 62 periphery of a member 61, it is different from the thing of drawing 1 or drawing 5 in that the high rigidity section 53 is further formed in the periphery of the fragile site 52 the high rigidity section 53 — the rigidity of fragile site 52 outside of the aforementioned vehicle room flank material main part 51 — raising — the initial stage at the time of air bag A expansion — setting — reinforcement — a member — 61 periphery — size — as the deformation force is centralized by the fragile site 52 when the deformation press force is added, and shown in drawing 8 , they are more certain and a thing for making a fragile site 52 fracture in an instant

[0029] As shown in drawing 7 , as the high rigidity section 53 of this example surrounds the periphery of a fragile site 52 (shown in drawing 6), it fixes the metal frame board 54 to the rear face of the vehicle room flank material main part 51 on a screw 56. the agreement 41 shown in drawing 6 or drawing 8 — the air bag door section and 42 — the fracture schedule section and 63 — reinforcement — the air bag hold case connection section formed in the member 61, and the bolt insertion for connection fixation of the connection section in 64 — it is a hole In addition, the aforementioned metal frame board 54 may be stuck to the background of the vehicle room flank material main part 51, and may be prepared.

[0030] The aforementioned metal frame board 54 may prepare the fixing section with the air bag hold case C in the part. The example which uses metal frame board 54A of the aforementioned structure for drawing 9 is shown. In addition, the thing of the same structure as what was shown in aforementioned drawing 6 or drawing 8 was shown using the same agreement. In this example, incurvation formation of the piece of metal 56A for fixing is carried out towards the air bag hold case C from partial 55A which fixes to vehicle room flank material main part 51 rear face of metal frame 54A, and the nose of cam of the piece of metal 56A for fixing is fixed to the side of the air bag hold case C with welding, a bolt, etc.

[0031] Furthermore, without using the aforementioned metal frames 54 and 54A, a heavy-gage part and a rib may be prepared in the vehicle room flank material main part 51 of fragile site 52 periphery, and the heavy-gage part and rib may constitute the aforementioned quantity rigidity section 53. The cross section of the fragile site 52 neighborhood showing the example in which drawing 10 prepared heavy-gage part 54B in fragile site 52 periphery, and drawing 11 are the cross sections of the fragile site 52 neighborhood showing the case where rib 54C is set up at the vehicle room flank material main part 51 rear face of fragile site 52 periphery.

[0032]

[Effect of the Invention] If it is in the structure of the vehicle room flank material which has the air bag door section of this invention in one as it illustrates above and being explained reinforcement — a fragile site forms in a vehicle room flank material main part along with the plate-like part periphery of a member — having — **** — the initial stage at the time of air bag expansion — setting — first — the aforementioned fragile site — fracturing — reinforcement — a member — the portion with which the reinforcement member and the vehicle room flank material main part were united is separated from the vehicle room flank material main part of a periphery consequently, the further air bag expansion in which the fracture schedule section for the air bag door sections is made to result in fracture after that — reinforcement — a member — the press deformation force does not join the vehicle room flank material main part of a periphery, but there is no possibility of producing faults, such as a crack and a crack

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[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the perspective diagram of the vehicle room flank material which has the structure of this invention.
[Drawing 2] It is the 2-2 cross section.
[Drawing 3] It is the perspective diagram showing the background of the air bag door section of this example.
[Drawing 4] It is the cross section showing the first stage at the time of air bag expansion of this example.
[Drawing 5] It is the cross section showing the time of air bag door section opening in this example.
[Drawing 6] It is the important section cross section of vehicle room flank material showing other examples of this invention.
[Drawing 7] It is the perspective diagram showing the background of the air bag door section of this example.
[Drawing 8] It is the cross section showing the first stage at the time of air bag expansion of this example.
[Drawing 9] It is the cross section showing the example of further others of this invention.
[Drawing 10] It is the cross section showing the example of further others of this invention.
[Drawing 11] It is the cross section showing the example of further others of this invention.
[Drawing 12] It is the perspective diagram showing an example of the vehicle room flank material which has the conventional air bag door section in one.
[Drawing 13] It is the 13 -13 cross section.
[Drawing 14] It is the cross section showing the time of the air bag expansion.
[Description of Notations]
10 Vehicle Room Flank Material
11 Air Bag Door Section
12 General Section
13 Fracture Schedule Section
21 Vehicle Room Flank Material Main Part
22 Division Section of Vehicle Room Flank Material Main Part
23 Fragile Site of Vehicle Room Flank Material Main Part
31 Reinforcement — Member
32 Reinforcement — Plate-like Part of Member
33 Reinforcement — Flection of Member
34 Reinforcement — Connection Section of Member
A Air bag
C Air bag hold case
I Starting device

[Translation done.]

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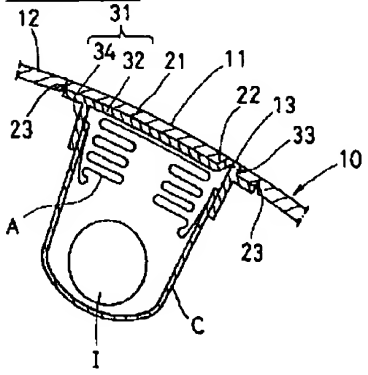
DRAWINGS

[Drawing 2]



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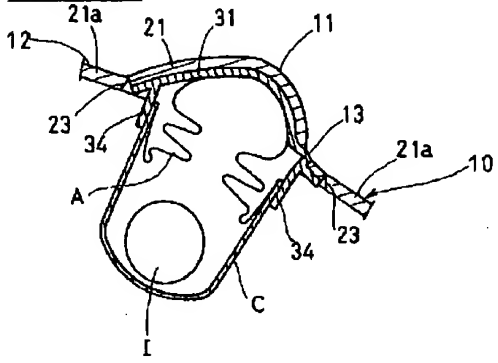

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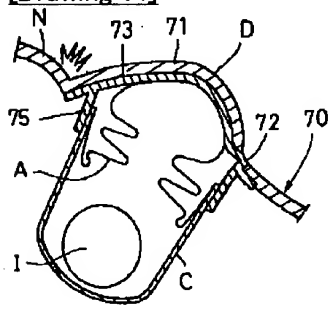

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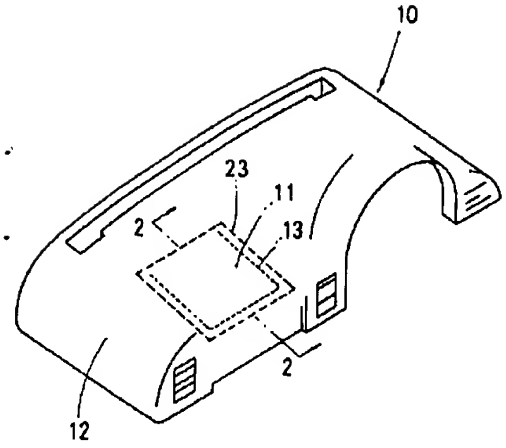

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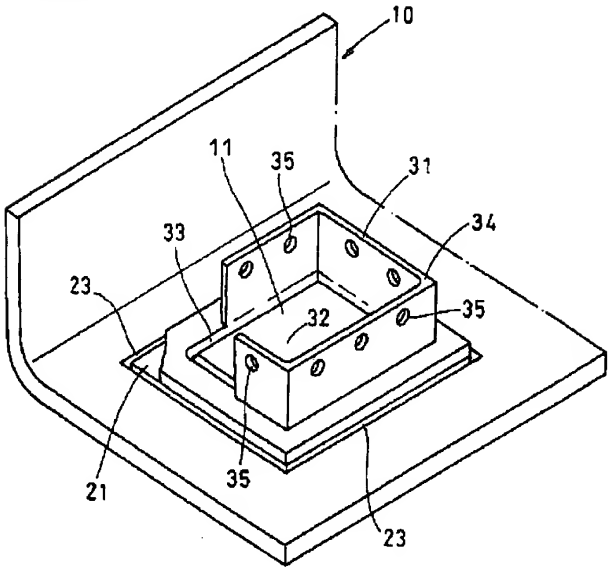

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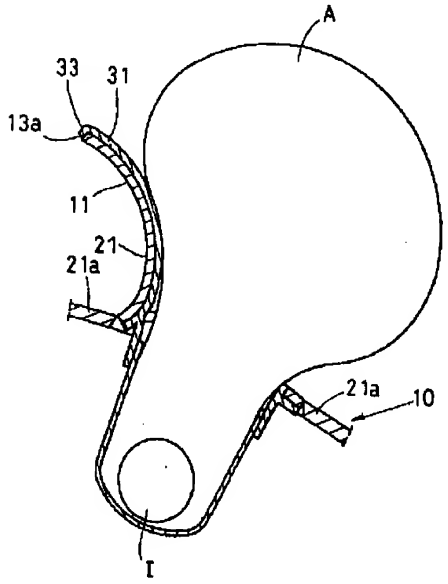

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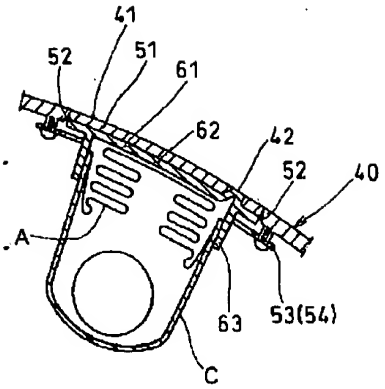

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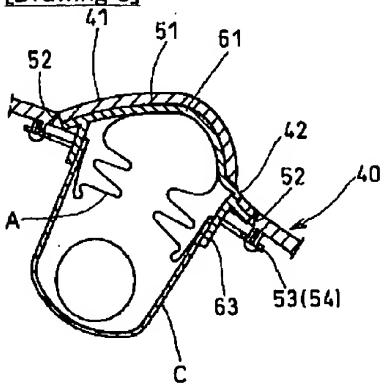

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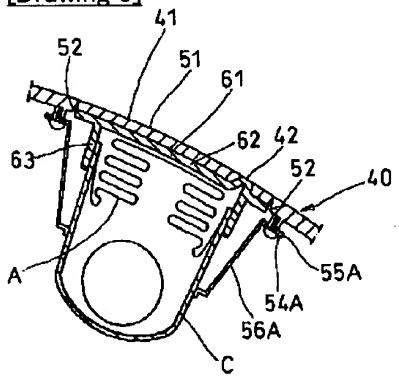

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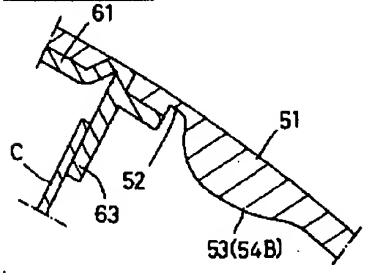
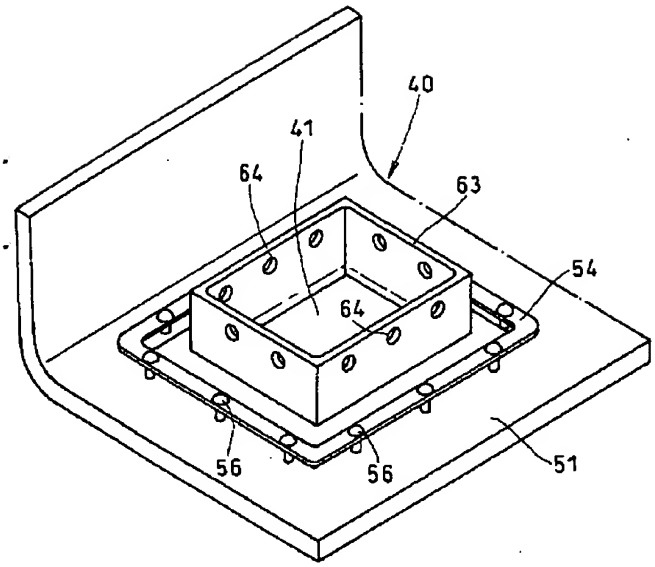


[Drawing 7]



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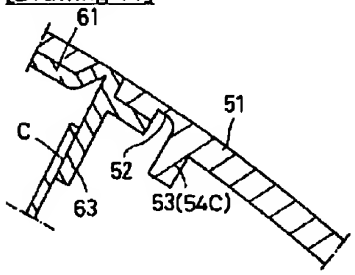
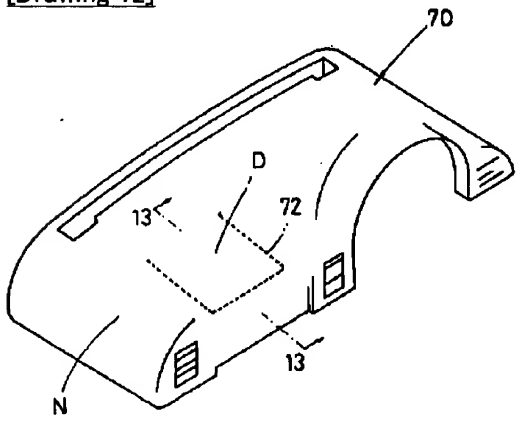
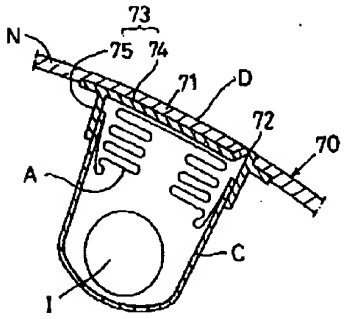


[Drawing 12]



[Drawing 13]



[Translation done.]

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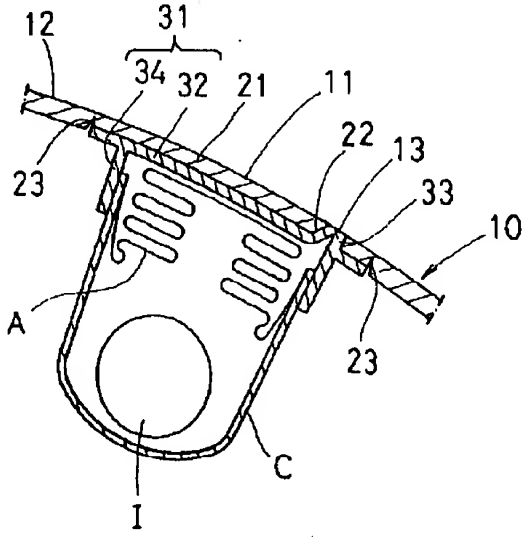
(54)【発明の名称】　エアバッグドア部を一体に有する車室側部材の構造

(57)【要約】
【課題】　エアバッグドア部を一体に有する車室側部材において、超低温時のエアバッグ膨張時に補強部材の周縁で亀裂や割れが発生するのを防ぐことを目的とする。
【解決手段】　板状部３２裏面の縁付近にエアバッグ収容ケースＣとの連結部３４の形成された補強部材３１が、硬質樹脂製の車室側部材本体２１の裏面に一体に設けられるとともに、前記補強部材の板状部と車室側部材本体との一体部にエアバッグ膨張時に破断する破断予定部１３が形成されて該破断予定部で区画されたエアバッグドア部１１を有する車室側部材１０において、前記車室側部材本体には、前記補強部材の板状部外周に沿ってエアバッグ膨張時に前記破断予定部より先に破断する脆弱部２３が形成されている。



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【特許請求の範囲】

【請求項1】　板状部とその裏面の縁付近に形成されたエアバッグ収容ケース連結部とよりなる補強部材が、硬質樹脂製の車室側部材本体の裏面に一体に設けられるとともに、前記補強部材の板状部と車室側部材本体との一体部にエアバッグ膨張時に破断する破断予定部が形成されて該破断予定部で区画されたエアバッグドア部を有する車室側部材において、

前記車室側部材本体には、前記補強部材の板状部外周に沿ってエアバッグ膨張時に前記破断予定部より先に破断する脆弱部が形成されていることを特徴とするエアバッグドア部を一体に有する車室側部材の構造。

【請求項2】　請求項1において、車室側部材本体が脆弱部外側に高剛性部を有することを特徴とするエアバッグドア部を一体に有する車室側部材の構造。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、エアバッグドア部を一体に有する車室側部材の構造に関する。

【0002】

【従来の技術】近年、自動車においては助手席にもエアバッグ装置が設けられるようになった。このエアバッグ装置は、エアバッグと、そのエアバッグを折り畳んだ状態で収容するキャニスタと呼ばれるエアバッグ収容ケースと、作動装置（インフレータ）とからなり、助手席前面のインストルメントパネル等からなる車室側部材の裏側に取り付けられる。エアバッグ装置が設けられた車室側部材のエアバッグ部は、エアバッグのための展開開口部を有し、この開口部は平時には前記インストルメントパネルと同種の外観をもったエアバッグドアによって覆われている。そして、一旦衝突などによって自動車が大きな衝撃を受けた時には、前記エアバッグケース内に収納されているエアバッグが作動して膨張し、エアバッグドアを裏側から押して開口させる。

【0003】しかし、エアバッグ用展開開口部とエアバッグドアとが別体によって構成される構造のものにあっては、製品寸法のわずかなばらつきあるいは使用に伴う製品収縮などによりエアバッグドア周囲に隙間を生じ易く、インストルメントパネルの外観が損なわれるおそれがある。また、後工程によってインストルメントパネルのエアバッグ用展開開口部にエアバッグドアを取り付けることは工数を増大させることになる。

【0004】そこで、本発明者は前記不具合を解消するため、図12およびその13－13断面図である13図に示すように、一般部Nと一体に形成されたエアバッグドア部Dを有する車室側部材（インストルメントパネル）70の構造を考えた。この構造の車室側部材70は、ポリプロピレン樹脂等からなる硬質樹脂製の車室側部材本体71と、その裏面に一体に形成された補強部材73とよりなる。そして、前記補強部材73と車室側部

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材本体71の一体部分には薄肉の破断予定部72が形成され、その破断予定部72によってエアバッグドア部Dが区画形成されている。

【0005】前記補強部材73は、車室側部材本体71のエアバッグドア部Dの裏面を補強してエアバッグ膨張時に破断予定部72を確実に破断させるための板状部74と、その裏面の縁付近に形成されたエアバッグ収容ケース連結部75とよりなる。エアバッグ収容ケース連結部75は、エアバッグ収容ケースCとの連結に用いられる部分で、枠状からなり、エアバッグドア部Dの開き時にヒンジ部を兼ねる。この補強部材73は、金属製にすると重くなるため樹脂製からなる。図中の符合Aはエアバッグ、Iは作動装置である。

【0006】この構造にあっては、図14に示すように、作動装置Iが作動してエアバッグAが膨張すると、そのエアバッグAによりエアバッグドア部D裏面の補強部材73が車室内側へ押圧されて、まず、エアバッグドア部Dが車室内側へ膨らむ。そして、更なるエアバッグAの膨張により補強部材73が押圧され、それによって、車室側部材70にはエアバッグ収容ケースCとの連結部75付近、特にはその連結部75のコーナー部付近に大なる応力が加わって大きく変形する。その後、破断予定部72が破断してエアバッグドア部Dが開き、エアバッグAが車室内に展開する。

【0007】しかし、前記構造の車室側部材70に対し、実際の自動車使用条件より厳しい条件、すなわち、前記車室側部材本体70の脆化温度以下でエアバッグの展開試験を行なうと、前記破断予定部72が破断する前（エアバッグドア部Dが開く前）に、前記のように大きく変形する補強部材73の周縁で車室側部材本体71に亀裂や割れを生じることがある。さらに、場合によってはその亀裂を生じた部分や割れた部分が飛散するおそれもある。このような現象は、通常の自動車使用時には起こりえない超低温条件において発生するものであるものが、理想的なエアバッグ装置を追求する上では生じないのが望ましい。

【0008】

【発明が解決しようとする課題】そこでこの発明は前記の点に鑑み、エアバッグドア部を一体に有する車室側部材において、超低温時のエアバッグ膨張時に補強部材の周縁で亀裂や割れが発生するのを防ぐことを目的とする。

【0009】

【課題を解決するための手段】この発明は、板状部とその裏面の縁付近に形成されたエアバッグ収容ケース連結部とよりなる補強部材が、硬質樹脂製の車室側部材本体の裏面に一体に設けられるとともに、前記補強部材の板状部と車室側部材本体との一体部にエアバッグ膨張時に破断する破断予定部が形成されて該破断予定部で区画されたエアバッグドア部を有する車室側部材において、前

記車室側部材本体には、前記補強部材の板状部外周に沿ってエアバッグ膨張時に前記破断予定部より先に破断する脆弱部が形成されていることを特徴とするエアバッグドア部を一体に有する車室側部材の構造に係る。

【００１０】この発明の構造にあっては、エアバッグ膨張時、補強部材外周位置の車室側部材本体に形成されている脆弱部が、エアバッグドア部用の破断予定部より先に破断する。そのため、エアバッグ膨張時の初期の段階において、エアバッグ収容ケースと連結されているエアバッグドア部分をその周囲の車室側部材本体から分離させることができる。したがって、その後のエアバッグ膨張によってエアバッグドア部に更に大きな押圧変形力が加わっても、該エアバッグドア部外側に位置する前記分離した車室側部材本体には何等押圧変形力を受けず、亀裂や割れを生じることがない。

【００１１】また、前記車室側部材本体の脆弱部外側に高剛性部を設ければ、エアバッグ膨張時に前記脆弱部に効率的に押圧力が集中するため、エアバッグ膨張の初期段階において、より確実に前記脆弱部を破断させることができる。なお、前記車室側部材本体の脆弱部は、車室側部材本体の他の部分よりも相対的に弱いことを意味する。したがって、前記脆弱部は車室側部材本体を薄肉として形成するのみならず、薄肉にすることなく前記高剛性部を脆弱予定部近くに設けることにより高剛性部付近に相対的に脆弱な部分を形成してもよい。

【００１２】

【発明の実施の形態】以下添付の図面に従ってこの発明を詳細に説明する。図１はこの発明の構造を有する車室側部材の斜視図、図２はその２－２断面図、図３は同実施例のエアバッグドア部の裏側を示す斜視図、図４は同実施例のエアバッグ膨張時の初期を示す断面図、図５は同実施例におけるエアバッグドア部開放時を示す断面図である。

【００１３】また、図６はこの発明の他の実施例を示す車室側部材の要部断面図、図７が同実施例のエアバッグドア部の裏側を示す斜視図、図８は同実施例のエアバッグ膨張時の初期を示す断面図、図９はこの発明の更に他の実施例を示す断面図、図１０はこの発明の更に他の実施例を示す断面図、図１１はこの発明の更に他の実施例を示す断面図である。

【００１４】図１ないし図３に示す車室側部材１０は、自動車のインストルメントパネルとして用いられるもので、助手席側にエアバッグドア部１１をその他の一般部１２と一体に有する。この車室側部材１０は、車室側部材本体２１と、その裏側に一体に設けられた補強部材３１とよりなって、エアバッグＡ膨張時に破断してエアバッグドア部１１の開きを可能にするための破断予定部１３が、エアバッグドア部１１を区画するように平面視略U字形に形成されている。なお、破断予定部１３の平面形状はH字形とされることもある。

【００１５】前記車室側部材本体２１は、車室側部材１０の外形を定めるとともにその表面を構成するもので、射出成形等により所要形状に形成された硬質樹脂成形品からなる。車室側部材本体２１構成する硬質樹脂は、車室側部材に求められる強度や剛性を有するもので、ポリプロピレン樹脂等の汎用硬質樹脂が用いられる。特には、剛性および形状保持性等の点から、ＪＩＳ－Ｋ７２０３による曲げ弾性率が２００００ｋｇｆ／ｃｍ^2 以上、ＪＩＳ－Ｋ７２０７による熱変形温度が１２０℃以上（４．６ｋｇｆ荷重）のものが好ましい。この実施例の車室側部材本体２１は、曲げ弾性率が２７０００ｋｇｆ／ｃｍ^2 、熱変形温度が１３２℃、厚み２．５mmのポリプロピレン樹脂（ＰＰ）製からなる。

【００１６】前記車室側部材本体２１の破断予定部１３の部分には、その破断予定部１３に沿って分断部２２が形成され、その分断部２２に車室側部材本体２１裏面の補強部材３１が食い込み車室側部材本体２１表面で露出している。この分断部２２の幅は適宜とされるが、一般的に２mm以下程度とされる。なお、この分断部２２は、車室側部材本体２１と補強樹脂部材３１とを構成する樹脂の色を同色とすることにより、さらには一体成形することにより外面からはほとんど判別できないようにするのが好ましい。

【００１７】また、前記車室側部材本体２１のエアバッグドア部１１の外側には、他部よりも弱い脆弱部２３が補強部材３１の外周に沿って形成されている。この脆弱部２３はエアバッグ膨張時、前記破断予定部１３の破断よりも先に破断して補強部材３１周囲の車室側部材一般部１２を、補強部材３１と車室側部材本体２１との積層部分から分離させるものである。この実施例の脆弱部２３は図２および図３からよく理解されるように、略V字形の切り込みによる薄肉によって形成されている。もちろん、略V字形に限らずU字形やその他の形状によって薄肉としてもよい。その場合の薄肉の脆弱部の厚みは０．３～０．５mm程度とするのが一般的である。

【００１８】補強部材３１は、前記エアバッグドア部１１裏側の車室側部材本体２１を補強して前記破断予定部１３で破断し易くするとともに、硬い車室側部材本体２１の破断部端面を隠蔽するためのもので、前記車室側部材本体２１を構成する硬質樹脂よりも柔軟な樹脂で形成され、車室側部材本体２１のエアバッグドア部１１裏面側に一体に設けられている。

【００１９】この実施例の補強部材３１は、厚み３mm、縦１５０mm、横３２０mmの長方形板状部３２に、車室側部材本体２１側へ突出するように略逆V字形に屈曲した屈曲部３３が、前記破断予定部１３の形状に合わせて平面視略U字形に形成されている。前記屈曲部３３は破断予定部１３の車室側部材本体２１に形成されている分断部２２に食い込むもので、屈曲部３３頂点で破断し易いように該頂点の厚みが他部よりも薄くされ

る。本実施例では0．3～0．5mm程度とした。

【0020】前記のように車室側部材本体21の表面側へ屈曲した屈曲部33は、平時に破断予定部13付近を車室側部材本体21表面側から押した際に、その押圧方向と略平行方向となって大なる剛性を発揮するため、平時における強度増大効果が高く、破断予定部13の亀裂を防止する作用もある。

【0021】また、前記補強部材31は、板状部32裏面の縁付近に枠状の連結部34が形成されている。この連結部34は、エアバッグ収容ケースCの開口端部外周に嵌められ、エアバッグ収容ケースCとこの車室側部材10との連結に用いられる。なお、その連結固定は、図示しないボルト等の固定手段を用いてなされる。図3に示す符号35はそのボルト挿通孔である。

【0022】前記補強部材31は、車室側部材本体21を構成する硬質樹脂より柔軟な樹脂からなり、JIS－K7203の曲げ弾性率が1000kgf／cm^2 ～5000kgf／cm^2 の樹脂が、エアバッグ膨張時に前記破断予定部13の屈曲部33で破断し易く、またエアバッグドア部11の補強の点で好ましい。前記車室側部材本体21が曲げ弾性率27000kgf／cm^2 のPP製からなるこの実施例においては、補強部材31は、曲げ弾性率3000kgf／cm^2 のTPO（ポロオレフィン系熱可塑性エラストマー）樹脂からなる。

【0023】なお、前記車室側部材10の成形は、まず射出成形等によって前記補強部材31を成形し、次いでその補強部材31を車室側部材成形型にインサートとして配置し、硬質樹脂を射出して補強部材31と一体となった車室側部材本体21を形成することにより、容易に行なうことができる。また、前記車室側部材本体21の射出成形時、前記補強部材の屈曲部33の頂部を車室側部材成形型の型面に密着させておけば、得られる車室側部材本体21は、図2に示したようにエアバッグドア部11用の破断予定部13において前記補強部材31の屈曲部33が食い込んだ分断部22となる。また、前記車室側部材本体21の薄肉の脆弱部23は、最初から設けてもよいし、成形後に高周波ウェルダーや熱刃あるいはコールドプレスカッター等で形成してもよい。

【0024】この構造によれば、前記車室側部材10はその表面においてエアバッグドア部11が一般部12と一体に形成されているため、エアバッグドア部11の周囲に隙間がなく、外観がきわめて良好である。そして、衝突等により自動車に衝撃が加わった時には、作動装置Iが作動してエアバッグAが膨張し、そのエアバッグAにより補強部材31の裏面が押されてエアバッグドア部11部分が車室内側へ膨らむ。その際、車室側部材10は、補強部材31の縁においてエアバッグ収容ケースCと連結されているため自由な変形が妨げられ、その連結部34付近に大なる押圧変形力が加わって大きく屈曲する。その結果、前記車室側部材本体21の補強部材31外周に形成されている脆弱部23に応力が集中して図4のように破断し、補強部材31と車室側部材本体21とが一体となった部分が、その周囲の一般部12の車室側部材本体21aから分離する。

【0025】更にエアバッグAが膨張すると前記補強部材31が押圧されてエアバッグドア部11部分の車室側部材が車室内側へ大きく膨らみ、遂にはエアバッグドア部11を区画する破断予定部13が破断し、図5に示すようにエアバッグドア部11が開き、エアバッグAが車室内に展開する。その際、前記補強部材31の存在する部分から既に分離されている車室側部材本体21aは、何等押圧力を受けることがない。したがって、この構造の車室側部材10に対して、通常の自動車使用時には生じないような低温状態で衝突試験を行なっても、前記補強部材31周縁には無理な応力が加わらず、不規則な亀裂や割れを生じることがなくなる。符合13aはエアバッグドア部11の破断部である。

【0026】さらにこの実施例においては、前記エアバッグドア部11の破断部13a端面が、前記車室側部材本体21よりも柔軟な補強部材31の屈曲部33で隠蔽された状態となるため、硬い硬質樹脂が露出してなく、車室側部材として好適である。

【0027】次にこの発明の他の実施例について示す。図6は他の実施例の車室側部材40の構造を示す断面図、図7はそのエアバッグドア部41の裏面側を示す部分斜視図、図8はその車室側部材におけるエアバッグ膨張初期を示す断面図である。

【0028】この車室側部材40は、図1ないし図5に示した実施例と同様に車室側部材本体51と補強部材61とよりなり、その補強部材61の板状部62外周に沿って車室側部材本体51に脆弱部52を有するものであるが、さらにはその脆弱部52の外周に高剛性部53が形成されている点で図1ないし図5のものと相違する。高剛性部53は前記車室側部材本体51の脆弱部52外側の剛性を高めて、エアバッグA膨張時の初期段階において補強部材61周縁に大なる変形押圧力が加わった際にその変形力を脆弱部52により集中させ、図8に示すように、より確実かつ瞬時に脆弱部52を破断させるためのものである。

【0029】この実施例の高剛性部53は、図7に示すように金属製枠板54を脆弱部52（図6に示す）の外周を包囲するようにして車室側部材本体51の裏面にビス56で固定したものである。図6ないし図8に示す符合41はエアバッグドア部、42は破断予定部、63は補強部材61に形成されたエアバッグ収容ケース連結部、64はその連結部の連結固定用のボルト挿通孔である。なお、前記金属製枠板54は、車室側部材本体51の裏側に密着させて設けても良い。

【0030】前記金属製枠板54は、その一部にエアバッグ収容ケースCとの固着部を設けてもよい。図9に前

記構造の金属製枠板５４Ａを用いる例を示す。なお、前記図６ないし図８に示したものと同じ構造のものについては同一符合を用いて示した。この実施例では、金属製枠体５４Ａの車室側部材本体５１裏面へ固着される部分５５Ａからエアバッグ収容ケースＣへ向けて固着用金属片５６Ａが屈曲形成されていて、その固着用金属片５６Ａの先端が溶接やボルト等でエアバッグ収容ケースＣの側面に固定される。

【００３１】さらに、前記金属製枠体５４，５４Ａを用いることなく、脆弱部５２外周の車室側部材本体５１に厚肉部やリブを設け、その厚肉部やリブによって前記高剛性部５３を構成してもよい。図１０は厚肉部５４Ｂを脆弱部５２外周に設けた例を示す脆弱部５２付近の断面図、図１１はリブ５４Ｃを脆弱部５２外周の車室側部材本体５１裏面に立設した場合を示す脆弱部５２付近の断面図である。

【００３２】

【発明の効果】以上図示し説明したように、この発明のエアバッグドア部を一体に有する車室側部材の構造にあっては、補強部材の板状部外周に沿って車室側部材本体に脆弱部が形成されていて、エアバッグ膨張時の初期段階においてまず前記脆弱部が破断して、補強部材外周の車室側部材本体から補強部材と車室側部材本体とが一体となった部分を分離する。その結果、その後エアバッグドア部用の破断予定部を破断に到らしめる更なるエアバッグ膨張によっても、補強部材外周の車室側部材本体には押圧変形力が加わらず、亀裂や割れ等の不具合を生じるおそれがない。

【図面の簡単な説明】

【図１】この発明の構造を有する車室側部材の斜視図である。

【図２】その２－２断面図である。

【図３】同実施例のエアバッグドア部の裏側を示す斜視図である。

【図４】同実施例のエアバッグ膨張時の初期を示す断面図である。

【図５】同実施例におけるエアバッグドア部開放時を示す断面図である。

【図６】この発明の他の実施例を示す車室側部材の要部断面図である。

【図７】同実施例のエアバッグドア部の裏側を示す斜視図である。

【図８】同実施例のエアバッグ膨張時の初期を示す断面図である。

【図９】この発明の更に他の実施例を示す断面図である。

【図１０】この発明の更に他の実施例を示す断面図である。

【図１１】この発明の更に他の実施例を示す断面図である。

【図１２】従来のエアバッグドア部を一体に有する車室側部材の一例を示す斜視図である。

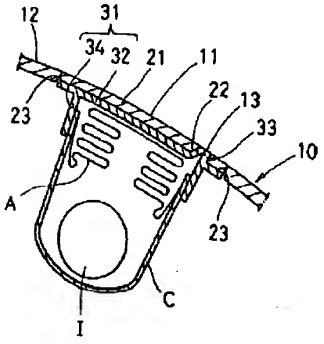
【図１３】その１３－１３断面図である。

【図１４】そのエアバッグ膨張時を示す断面図である。

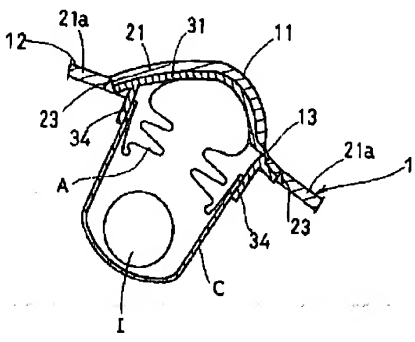
【符号の説明】

１０　車室側部材
１１　エアバッグドア部
１２　一般部
１３　破断予定部
２１　車室側部材本体
２２　車室側部材本体の分断部
２３　車室側部材本体の脆弱部
３１　補強部材
３２　補強部材の板状部
３３　補強部材の屈曲部
３４　補強部材の連結部
Ａ　エアバッグ
Ｃ　エアバッグ収容ケース
Ｉ　作動装置

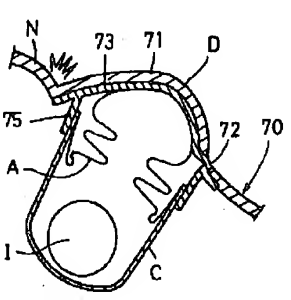
【図２】



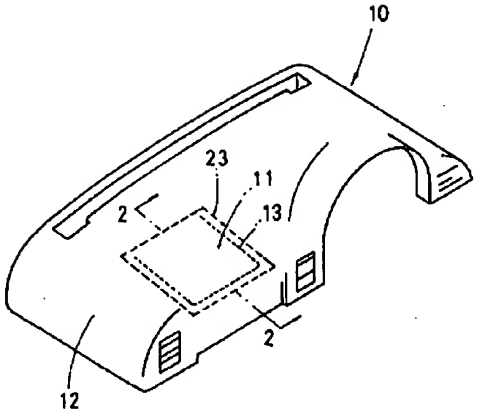
【図４】



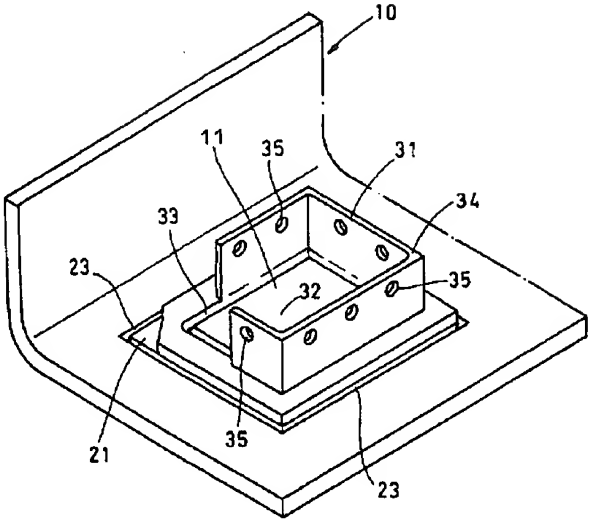
【図１４】



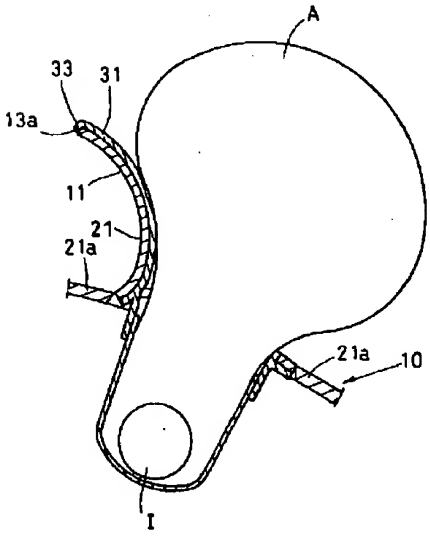
【図1】



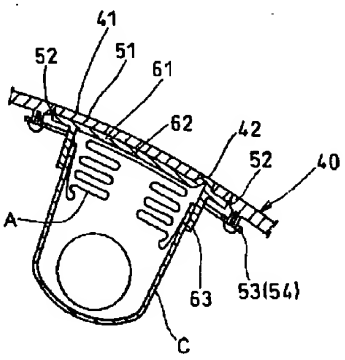
【図3】



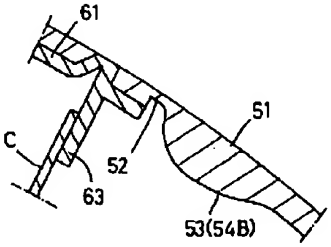
【図5】



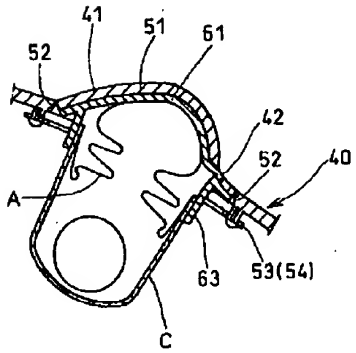
【図6】



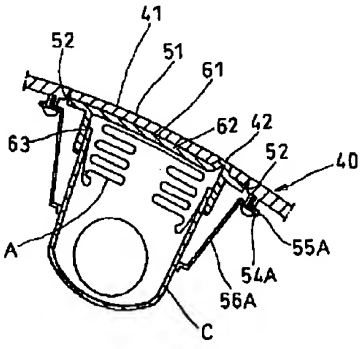
【図10】



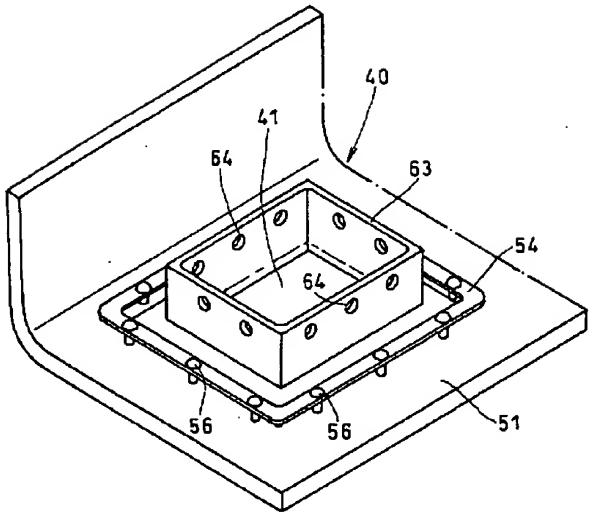
【図8】



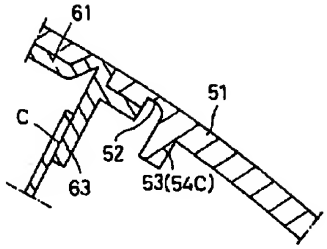
【図9】



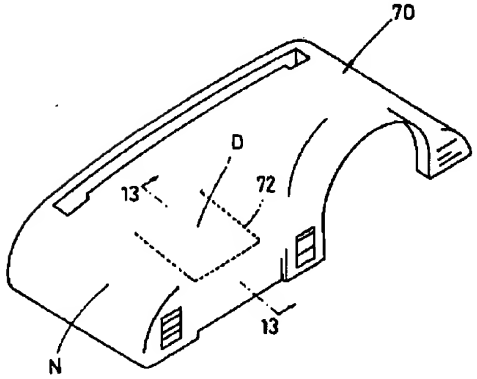
【図７】



【図１１】



【図１２】



【図１３】